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TELETYPE PAPER; NEW; FRESH from the mill. 4 1/2" rolls white or canary. For all friction feed Teletype machines. \$20.00 case of 12, Buy 5 cases, only \$18.00 each. ZTY-RTTY Paper Co. PO Box 147, Corunna, MI 48817

MINI-MANUALS ON FOLLOWING EQUIPMENT, \$2.95 each -- M15/19 Wiring Hints and Diagrams. CV-89/URA-8 FSK Converter. TDA-2 Stelma Teletype Distortion Analyzer. AN/SGC-1 FSK Converter. Teletype Gear Guide for all teletype Corp. equipment. SASE for surplus list. Jim Cooper W2BVE, POB 73, Paramus, NJ 07652.

FOR SALE; FSK CONVERTER CV-278-GR and transmitter modulator MD-203 GR. Get on RTTY with the T-195 transmitter with these units. Used very little, sale or trade. L. Belcher, 112 Sheila, Glasgow, KY 42141.

ADDRESS CORRECTION REQUESTED
RTTY JOURNAL
P.O. Box 837
Royal Oak, MI. 48068

FIRST CLASS MAIL



RTTY

January, 1976

JOURNAL

EXCLUSIVELY AMATEUR RADIO TELETYPE

Volume 24 No. 1

35 Cents



RTTY and Sakl have good time in Japan.

Top - "Mac", JH1ISF - "Doc", JH1TFF

Bottom. "Fred" CX7BZ, - "Jin" JA1ACB

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GIANT - RTTY FLASH CONTEST.

The *cq* electronics Magazine of Italy is once again sponsoring the "Giant" RTTY Flash Contest. The purpose of this Contest is to promote increased interest in the RTTY mode of operation as used by Radio Amateurs. This is a "flash" Contest because the total contest time is limited to 16 hours periods on two successive weeks in January 1976.

1. **CONTEST DATES**
1st 15.00-23.00 GMT January 17th 1976
2nd 07.00-15.00 GMT January 25th 1976
2. **BANDS**
3.5, 7, 14, 21, 28 MHz Amateurs Bands and via OSCAR.
3. **COUNTRY STATUS**
The ARRL Countries list will be used except that the W Call areas W0 to W9 the VE Call areas from VO to V9 and VK from VK1 to VK9 will be considered as separate Countries.
4. **MESSAGES**
Messages will consist of:
a) Call sign
b) RST
c) Zone number (Example 11XXX 599-15)
5. **EXCHANGE POINTS**
a) Each two-way RTTY contact with station in one's own zone will receive 2 exchange points.
b) Each two-way RTTY contact with station outside one's own zone will receive exchange points in accordance with
c) Each two-way RTTY contact via OSCAR will receive double points.
Note: stations may not be contacted more than once on any one band but additional contacts may be made with the same station if a different band is used.
6. **LOGS AND SCORE SHEETS**
Use one log for each Band.
Logs to contain: Date, Time (GMT), Call signs, Countries, RST and zone numbers sent and received, multipliers Country, Points and final score.
All Logs must be received by not later than February 29th 1976 in order to qualify.
Send them to:
Prof. Franco Fantl
Via A. Dalfolio 19
40139 Bologna, ITALY
7. **MULTIPLIERS**
A multiplier is given for each Country worked. A separate multiplier may be claimed for the same Country if a different band is used.
The operators own Country does not qualify for a multiplier, count zero point and zero the QSO numbers.
8. **SCORING**
Total exchange points times the total number of multiplier times the total number of QSO.
9. **HANDICAP**
World championship holders: less 12% of the total final score
Winners of five or more Contests: less 8% of the total final score
Winner of one to four Contests: less 4% of the total final score
Contestants with a previous Contest placing 2nd to 10 place: less 2%.
10. **SWL'S**
This contest is also open to SWL RTTYers. For the SWLs the same scoring rules are valid. A separate results table will be made for these entries.
The Logs for SWLs must contain: date, time (GMT), Call sign of station heard, RST and Zone number sent by station heard, multipliers Countries, points and final score.
The same stations only valid once on each band.
11. **AWARDS, MEDALS & FREE SUBSCRIPTIONS**
The contest Committee will compile two separate lists.
a) General classification
b) Short Wave Listeners
In each of these two classes the following awards will be made:
1st: gold medal
2nd: silver medal
3rd: bronze medal
4th to 7th: will receive a 12 month's subscription to the *cq* electronics magazine.
8th to 10th: will receive a 6 month's subscription to the *cq* electronics magazine.
There will also be awards for all of the operators and SWLs that send logs.
12. **WORLD RTTY CHAMPIONSHIP TABLE FOR 1975**
Points and positions achieved will be valid for inclusion in the WORLD RTTY championship table for 1975. The "Giant" is the last Contest for consideration for the Championship for the year 1975.
13. **RULES OF BEHAVIOUR AND PENALIZATION.**
The Logs must be compiled in accordance with the rules listed in (6).
The contacts must be made by means of the RTTY mode and it is not permitted to use other modes of transmission either before, during or after the exchange of messages by Radio Teletype.
During the Contest it is expected that Amateurs will observe the fundamental rules of courtesy and good operating during contacts.
Failure to observe any of the above Rules will result in the exclusion of the entry from the final results and any such Logs received will be considered as check Logs.
All logs received become the property of the Edition CD and will not be returned.
The decision of the organising Committee in any dispute will be final and any subsequent controversy cannot be referred to the Civil Court.

NS-1 PLL Demodulator Up-Date.

NAT STINETTE, W4AYV
PO Box 1043
TAVARES, FL. 32778

Since the NS-1 PLL RTTY Demodulator first appeared in RTTY Journal, October 1974 and later in Ham Radio February 1975, I have received numerous inquiries about its operation. I hope the following will answer some of the questions asked and also give some added tips.

First, as an explanation, the NS-1 was developed primarily for FSK downward shift on the HF bands using low tones to take advantage of narrow receiver passband. The 741 limiter drops off around 2000 Hz so the tones must be within this limit. On FSK the tones can be varied by receiver tuning so it is very easy to obtain these low tones as required. Reversal of shift is accomplished by changing sidebands if receiving in the SSB mode or moving the BFO to the other side if receiving in the CW mode.

I suppose the most often asked question concerned the value of the zero center meter adjustment pot. This depends on the meter, i.e., whether the movement is 50 u.a., 200 u.a., 1 m.a., etc. The easiest way to determine this value is to put a .5M pot. in series with the meter and gradually reduce the resistance until full scale plus is obtained on mark/hold signal. This resistance can then be measured and a fixed resistor substituted.

If you don't have a zero center meter or are unable to find one, Fig. 2 shows a circuit which utilizes a regular 0-1 MA meter. Before connecting the 18K resistor to the "M" terminal, set the 25K pot. about midway, ground the 18K resistor to chassis and adjust the 25K pot. to center scale (.5MA). Now when the 18K resistor is hooked to the "M" terminal the meter will act like a zero center meter with plus to the right and minus to the left.

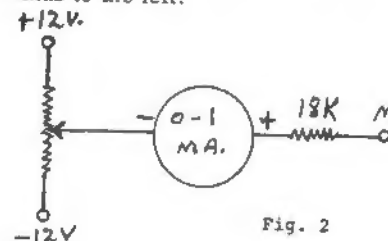


Fig. 2

Several asked where to connect a scope to receive a cross pattern. A scope cross pattern requires tuned filters to distinguish between the mark and space tones, one displayed vertically and the other one horizontally. Since the NS-1 has no filters there is no place to connect the scope. However, if you have a scope with tuned filters which will produce a cross pattern, connect it ahead of the NS-1 or at the receiver output. Tune in a signal that gives a good cross pattern and then adjust R-1 the 5K VCO pot. until you get good copy. Thereafter you can use the cross pattern for tuning.

Some complained that they were unable to get wide shift copy. The usual 2125/2975 tones will not work as the 741 limiter will not accept frequencies much above 2000 Hz as stated previously. So tones say around 2125/1275 should be used. A compromise setting of R-1 can be found which will permit copy of both wide and narrow shifts.

The purpose of the switch is to put the teletype machine in a "hold" condition. Random noise and signals will produce garble when tuning. Also the switch should be closed when transmitting as interaction between the receiver and TU will also produce garble.

Remember that the NS-1 will act very much like any other FM demodulator. If a stronger station is adjacent to the one you are trying to copy, it will take over if it is strong enough. I have found that the receiver T-notch filter is quite effective at times. Also, use the narrowest selectivity you have on your receiver which will permit copy of the tones. This reduces QRM. One ham wrote that he installed an active audio filter (2100-2300 Hz.) ahead of the NS-1 and adjusted the unit for 2295/2125 Hz. He says this arrangement compared very favorably with the ST type terminal units.

NS-1A MODIFIED UNIT FOR UPWARD SHIFT

A few people tried to use the NS-1 on AFSK on the six and two meters VHF bands and found it would not work. This is because AFSK is usually upward shift (mark low, space high) and the NS-1 will not copy this way. AFSK tones are fixed and nothing can be done at the receiving end to reverse the shift and there are no provisions on the TU for reversal.

In order to achieve copy of upward shift it is necessary to reverse the polarity of the voltage coming out of the 741

IRWIN M. HOFF, W6FFC
12130 Foothill Lane
LOS ALTOS HILLS, CA. 94022

In order to transmit teleprinter signals over the air one of two systems are used: (1) FSK (frequency shift keying) of the VFO or (2) AFSK (audio frequency shift keying) of the microphone input of a voice-type transmitter. Either method has advantages and disadvantages. While FSK is very simple, quite inexpensive and highly reliable, it is difficult to use on "transceive" particularly if the operator does switch from 170 shift to 850 shift. FSK often poses problems for proper C.W. identification as well.

AFSK on the other hand is substantially more complex, far higher in price to implement, more prone to transient transmission, often more difficult to adjust to proper shift and can generate problems on h.f. such as unwanted sidebands, etc.

In general, however, the intelligent use of AFSK gives excellent results, particularly when the operator is aware of the pitfalls and has taken reasonable precautions against their occurring.

To be satisfactory for AFSK, a SSB transmitter must have excellent inherent carrier and sideband suppression. This virtually eliminates the older phasing-type units (such as the 20-A and HT-37) from any further consideration. Most SSB units use either a 2.1 or 2.4 KHz. i.f. bandwidth. The filter is placed to one side of the carrier so audio of 300-2400 is achieved. The filter skirt is sharp enough the carrier usually suppressed approximately 20 db. by merely placing it off to one side, plus an additional 30 db. perhaps in the balanced modulator. This gives a total potential of 50-55 db. carrier suppression. This assumes the balanced modulator has been adjusted at least a few times since you bought the unit (unlikely in most amateur installations) and assumes you do not overdrive the input. This alone is often difficult to achieve since very few SSB transmitters have facilities to monitor the input level or even the grid drive to the final amplifiers.

Since the operator would like superior carrier and sideband suppression, a simple modification not only achieves a

radical improvement of this type but also makes it simple to allow use of normal audio tones used on either 170 or 850 shift RTTY.

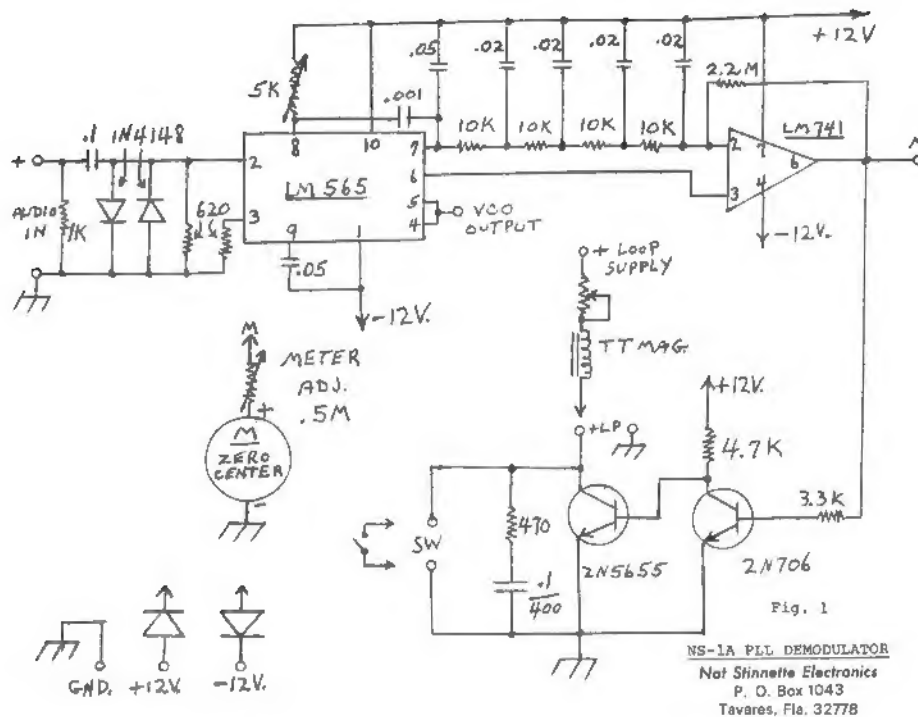
The BFO crystal normally used while in lower sideband gives audio of 300-2400 on the typical transmitter/receiver. This of course is totally inadequate for the customary 850 shift tone of 2975. This may well be one reason so very little 850 shift is heard on normal amateur RTTY frequencies the past few years! At any rate if the BFO crystal is replaced with another that is 1 KHz. further from the carrier oscillator frequency, audio of 1300-3400 may now be transmitted or received. This adequately includes both 170 shift and 850 shift.

At this point many operators would shrug their shoulders and say it's an unnecessary change in that they already receive 2295 just fine for 170 shift. What they don't realize is the large improvement in carrier suppression and unwanted sideband suppression the simple xtal change gives. Theoretically you can pick up around 30-35 db. additional carrier suppression and all but eliminate unwanted sidebands. If a narrow 500 Hz. filter is used in the receiver such a BFO xtal change is obviously a requirement, but at the same time a similar change to the transmitter gives such potential improvement as to merit serious consideration.

The Mainline AK-2 AFSK is similar electrically to the AK-1. Several minor but interesting things have been added such as the mark-space output balance system, zero crossover keying to virtually eliminate transients and an improved C.W. identification shift.

A NE-555 timer chip is used as a pulse generator that runs at 4 times the normal mark speed. These pulses are then changed to square waves at the proper mark speed by the two flip-flops in the SN7473. These square waves have only odd harmonic output making their conversion to pure sine waves of excellent audio quality simple. The venerable 88 Mh. toroids are used in a 5-pole low pass filter that is easy to construct, needs no accurate tuning and gives excellent results.

Various types of oscillators/generators were tried and most worked quite well. The memorable thing about the pulse generator when compared with other types becomes particularly evident



comparator on mark/hold signal. Several circuit changes were tried including reversal of the two inputs to the 741. This change worked ok but the best results came after putting a transistor just before the 2N5655. A 2N706 was used. It switches the keying transistor off and on and has the effect of reversing the voltage from the 741 output. This permits smooth upward shift copy.

Also, the 741 limiter was eliminated since it is restricted to around 2000 Hz. This allows high tones to be used such as 2125/2975 Hz. Two reversed diodes were placed ahead of the 565 PLL. These give good limiting and prevent overload of the PLL. The 565 is very sensitive so no amplifier is needed. This modified arrangement now works equally well on AFSK and FSK, wide or narrow shift.

Revised circuit diagram is shown in Fig. 1 and has been designated the NS 1A. The same adjustment procedure as used on the NS-1 should be used for the NS-1A. The zero center tuning meter will now show full scale minus (left) reading on mark/hold signal. The tuning meter may not even be needed on AFSK.

I wish to thank Ron W8BBB, Buck WAQLEM, and Rich WB5FHU for their tests and evaluations of the NS-1A on AFSK. The added feature of AFSK copy should now encourage more activity on two and six meters RTTY with this simple terminal unit.

At present no modified boards are available, however, wired/tested NS-1A units are available now for \$29.95 ppd. The original NS-1 also at same price.

What are they? —

CONTINUED FROM PAGE 13

signals, and the Russians in Cuba, using 500, 1000 or 2000 Hz shift mostly. It looks like 90-speed, and may print a few letters with a 100-speed machine, before going out of sync for a while. What is printed, is purely coincidental. Lately, 14064 has had a lot of this. The Cuban one comes up anywhere from perhaps 14080 to 14330 kHz.

Some of the F4 FAX transmissions, on a purely black-and-white picture, may sound a bit like RTTY but, is not intended to run an RTTY printer.

The schematic diagram illustrates a CW keyer circuit. It begins with a +5V supply connected to a 0.1μF capacitor and a 10K resistor. The circuit includes two 7474 flip-flops, two 7473 flip-flops, and two NE-555 timers. Transistors Q1, Q2, Q3, and Q4 are used for switching. The circuit is designed to generate a CW signal for a radio transmitter, with components like 10K resistors, 100pF capacitors, and 10K resistors. The output is connected to a 10K resistor and a 100pF capacitor.

JANUARY 1976 7

position for a second transmitter or for the other shift, etc. On the author's unit, space needs to be attenuated for 170 shift and mark for 850 shift. A DPDT toggle switch was used, one position gives 850 shift, the other position gives 170 shift. The second pole is actually S2 and attenuates the proper tone for that shift.

The reader will also notice a second transistor/pot could be added to S2 -- one set for one level of attenuation for 170 and the other set for a different level of attenuation for the 850 shift. This control system offers a versatility few if any amateurs have previously had available.

C.W. IDENT:

The C.W. shift is set for approximately 275 Hz. The FCC requires a minimum of 100 Hz. so this is quite legal and very legible. It is enough wider than 170 shift it locks up auto-print demodulators within 2-3 characters normally, thus printing a minimum number of garble characters.

INPUT KEYING:

The keying input is versatile enough it may be used with almost any type of demodulator. It adapts immediately to the Mainline series of units such as the TT/L, TT/L-2, ST-5, ST-6, etc. If you for some reason like to run the AFSK straight off your keyboard, just hook the keyboard directly to the Keying input jack, then add a 1K resistor from the same input jack to plus five volts. You can also drive the keying input directly from an opto-isolator if you wish, again it would be necessary to add a resistor (10K this time) from the input to plus five volts.

STABILITY:

The AK-2 is quite stable when compared with some other R/C type AFSK units. Use of metal film resistors helps as does the polystyrene 0.01 capacitor. As the unit is in effect an oscillator, keeping it away from areas where temperature changes are excessive will greatly help. Leaving it on all the time helps also. The plus five volts should of course be well filtered and well regulated. The voltage should be greater than 4.5 volts and less than 5.5 volts maximum.

SUMMARY:

Even though the transmitter may already pass the audio frequency of the space tone used for RTTY, the BFO should really be moved approximately one KHz. more. This gives a drastic improvement in both the carrier suppression and unwanted sideband suppression.

AFSK units work in an excellent manner if the operator is aware of their advantages and disadvantages. This also assumes the operator has selected a suitable AFSK with good sine wave output, low harmonic content, minimum keying transients and low distortion. The Mainline AK-2 meets this criteria very nicely while remaining quite inexpensive. It offers both 170 and 850 shifts, a third shift for compulsory C.W. identification, zero-crossover mark-space transition for minimum keying transients and a most effective mark-space balance system.

*PC boards available from EDI, Box 951, Salem, Oregon, 97308.

Commercial Frequencies

As per our request for commercial stations printable on amateur equipment we received several answers both for weather stations. One is printed here. If some of you have other press stations you are copying just send us a narrative account of what and where and how you print them.

We have a very complete and detailed article on the interpretation of RTTY weather broadcasts. We hope to run it in the near future.

This is W2LTJ with a list of selected frequencies that I have logged here over the past several years:

Voice of America 60WPM 425 Shift
3.355, 5.454 5.460 5.898 6.864 7.709
9.3143 10.972 22.782

Miami Weather 60WPM 850 Shift
3.223 8.105 12.175 (At 8:12 a.m. & p.m. EST 4 pages of selected cities Wx & forecast for next two days.)

Miami WX 100WPM 850 Shift 3.235
5.925 8.130 10.950 14.395 16.440 4.0615
8.140 13.624 18.765

New York Weather Some 60WPM
5.940 8.110 13.620 16.2505 20.907

UPI News English Mostly 66WPM
425 to 585 Shift 7.760 8.183 9.327 14.843
24.470

AP News 66WPM 425 Shift 17.564
19.537 22.917 24.564

AFP News Some English 66WPM 425
Shift 7.535 8.022 10.185 14.795 17.545
19.525 20.318 20.505 21.822

All above frequencies are in MHZ
... DE W2LTJ AR

VHF RTTY NEWS

RON GUENTZLER, W8BBB Editor
212 GRANDVIEW Blvd.

Ada, Ohio 45810



Once again, we have a small quantity of good information. Please keep the information coming!

From David Hood, WA9IVB, we have: "Thought you would like to know that there are several of us RTTY buffs on 146.400 MHz in the central Indiana area. W9CNE, Bob, Kokomo; WA9CWE, Steve, Anderson; K9DZD, Monte, Middletown; WB9HVG, Shirley, Marion; WA9IVB, Dave, Elwood; WA9JWL, Frank, Anderson; and K9QHO, Mike, Carmel. We use 170 Hz shift most of the time and 850 Hz shift for pictures. We will welcome anyone who wishes to break in."

From Daniel Dolan, K4CFJ, Lexington, KY: "Phil Duff, WB4TPU, and I (along with several other RTTY enthusiasts here in Lexington) are very much interested in an autostart net on 2 meters. Unfortunately, we're all kind of new to the RTTY area and so have little feel for the requirements of AFSK on 2 meters, or with an autostart system. We have a local net on 28.6 MHz that meets on Wednesday nights."

From Richard Burgett, WB5FNU: "Just a note to let you know what's happening in the Baton Rouge area. We have a few guys that are active on 146.700 MHz, FM, 170 Hz shift (also 850 if needed). So far only four people have shown any interest, but we do have a good bit of interest in TTY in the area."

Hal Beebe, W9OEQ, Mokena, IL writes: "I am hoping that you might be

able to help me. I am looking for the state of West Virginia for my WAS and have been having very poor luck over the last few years. All I have to go is West Virginia and Vermont. . . I have just about given up on 2 meter RTTY here. I am fairly close to the Chicago area, but the age old problem is getting the guys on and keeping them on afterwards. . . . Can't help sometimes think that all the Selcal autostarts and timers and all have something to do with it. Maybe we have gotten to the point of being so automatic that now we don't even bother to turn on the rig ourselves." Anyone out there who can help Hal with his WAS problem?

From Jack Hart, WA2HWJ, we have information about Long Island: "WA-2HWJ and WA2TAP will be operational by the beginning of the year on 146.550 MHz, autostart. We'll be using 850 Hz shift and the usual RTTY procedures. While my 28ASR is set up for selective calling, we will not be using it at first. The two-meter situation in this area is unbelievable. We settled on .55 because there is little activity, at least up until this time! We are hoping to have WA2 SWL join us from the east end of the island and anyone else who would like to try autostart, for that matter!"

Well, that's it for this month. Let's have much more information. 73 ES CUL, RG.

SEASONS GREETINGS

Best Wishes to All

Ron, John, & Dusty

RTTY-DX

JOHN POSSEHL - W3KV
Box 73 Blue Bell, Pa., 19422



Hello there...

The RTTY segment of the European DX Contest (WAE) sponsored by the DARC took place this year over the week-end of 8-9 November under what appeared to be quite poor conditions. This situation was further complicated by unusually severe CW QRM due to the ARRL Sweepstakes occurring on the same week-end with its activity spilling over into the usual RTTY portion of the spectrum. Next year the RTTY Contest will take place the 13-14 November so at least this problem of CW should be at a minimum. As we were not able to participate and no input was received we cannot give any first hand impressions of the Contest at this time. There were indications of some confusion over the rule concerning QTC messages and no doubt this will be clarified next year.

The long standing Volta Contest had already taken place by the time you read this. The most important change this year of course was in the scoring. With contacts on 7 mhz counting double and contacts on 3.5 and 28 mhz counting triple the amount given on the Zone exchange point matrix there are apt to be some astronomical scores posted in addition to encouraging activity on these particular bands. Be sure to get your log in by 20 January.

QSL cards for JD1ABH on Marcus Island have been coming thru his manager JH1ISF. Unfortunately Kei is now QRT, as of 10 December, so RTTY activity from this rare spot is temporarily at an end. We understand that the replacement operator at the WX station will start up in the near future and we hope to inform you of this as soon as we get the information.

CT1EG has returned to England for several months so you may find Bern singing his G3VXO call. QTH is... Bernard J. Fielding
8 Blakes Way
Welwyn
Hertfordshire, GB

From F8XT via W8SDZ comes word of activity by P29MO in Papua. No further details at this time but it is a good one to look for. Whereas formerly Papua

and Territory of New Guinea were separate a recent political change now has both under the same management. If you work any P29 now it counts as another country in addition to the two you may have worked before.

W7BCT informs us that HL9WI plans RTTY activity real soon. He is already active on SSB and SSTV. He is listed as Bill Boykin via the Call Book QTH.

Some exciting information sent in by W9OEQ. Activity is planned from VP2S between 3-23 January 1976 by WB8JEY. Call sign not known at the moment but the operation will be from Palm Island in the St. Vincent Group. This would be a first on RTTY from this location. The next column will be too late for an update so better monitor 14 mhz soon after you get this.

John, VP2LAW, still plans RTTY activity from St. Lucia so the early days of 1976 promise some interesting RTTY activity.

Most of you are no doubt already aware or have worked the two new additions to the DXCC country list, St. Paul (VY), and Sable Island (VX). Both were very active on SSB/CW the latter part of October and early November. Both islands are under Canadian jurisdiction so it should not be too long before some of the VE boys get a RTTY DX-pedition going to one or both of these places. However, we have been informed that due to an non existing shore line it is a hazardous undertaking to get gear on to them.

It is our pleasure to announce the following "Merit Awards" recently issued.

Worked All States

Nr. 4 FG7XT Jean Wegimont

W A C 28 MHZ

Nr. 1 FG7XT Jean Wegimont

W A C 14 MHZ

Nr. 19 G3ZWW Mike Quee

Least you think that conditions on 10 Meters are again on the way up we hasten to add that Jean had the cards for the WAC back a few years ago when the band was still in good shape.

A correction to last month's note

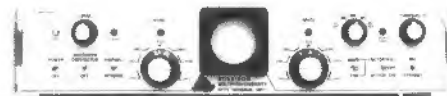
in reference to the 4U21TU operation during the CARTG Contest. The boys doing the operating were from the GARTG DAFG and not the DARC as reported. Thanks to DL3NO for bringing this to our attention.

Noted in "QMF" Official Journal of TOPS CW CLUB. Gun, ex-YN1CW/4W1CW, is now back home in Germany with the call sign DK3CX, his original DJ3LQ having been re-issued in his absence. New QTH is. Guenter Zaenker Strehleranger 9, 8 Munich 83, FRG

From the "HR Report" we read that "International Reply Coupons" (IRC), will be honored through the end of 1976 after which date all earlier IRC will be void and only the latest issue will be valid. As a matter of interest perhaps the most widespread use of the IRC has been by the radio amateur. More likely than not, the first time you went to your local Post office and asked the clerk for some IRC's you were greeted by a blank stare followed by his hasty paging through the book of regulations to find out what they were all about. For a really rare DX station that gets them by the hundreds or a station in a country not permitting the export of currency they are a source of "legal tender" and used to purchase such things as magazine subscriptions and the like. There also must be literally thousands of them that have been floating around the world for years and have never landed long enough to be cashed in. Postal rates have changed several times in recent years and the IRC has also been revalued by overprint or adding stamps so I guess the move is to clear out all the ancient IRC's still floating around and start all over again. I am even aware of a few chaps striving for DXCC in IRC, (we have only 18 confirmed here). So...it you have piles of them stashed away, please take note, they are NG after Dec. 31, 1976. The procedure may vary from country to country, or perhaps even from state to state, but at P.O. Box 73 I get either the first class surface rate in stamps to the country of issue or the equivalent in cash for each IRC.

"Happy New Year"

de John



Bi-Centennial "Worked All States" Contest

For most of you reading this it will soon be time for the start of RTTY's richest contest. The RTTY JOURNALS Bi-Centennial Worked all States contest with 3 Dovetron MPC Terminal Units (each worth about \$500.00) and plaques and certificates to the winners.

Until the contest has been running for a while it will be impossible to predict any possible problems or how soon someone may qualify as a winner. One thing we know is that stations in the scarce states will be like a DXer on some remote island. We certainly hope as many as possible will get on and make as many contacts as possible. To get on and make one contact with a friend and then disappear may be legal but not in the interest of fair play hams are noted for. On the other hand we strongly suggest that SASE envelopes be included with all requests for QSL cards. It is one thing to get on and give contacts but the QSL job can soon discourage active operation.

Anyone making WAS during 1976 gets a certificate, how long it will take for the big winners we have no idea. During a much lesser contest a few years back it took over a half year for the first person to make it. With more activity and interest however it may be done much sooner.

We felt that this type of a contest gave the most stations a chance to be active. Low power has a good chance along with the hi-power contest stations, a one or two week end contest shuts out everybody that can not make it at that time. Good operating and lots of it can even the chances for everyone.

Good Hunting, and as the contest progresses, we hope to report on the progress and help get the rare states active.

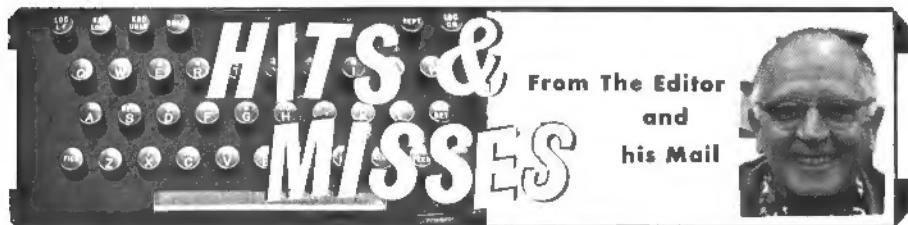
The Bi-Centennial WAS contest rules are simple. See December Journal for full particulars - Just work all states from Jan. 1st through December 31, 1976.

DOVETRON -

• Multipath-Diversity MPC

1000 RTTY Terminal Unit.

3 [Three] to the Winners.



For the past several months we have wondered why we always seemed behind in our work. In January of 1975 we mailed 2181 copies of the Journal. The last issue of 1975 was 2664, a net gain of 483 or almost 20%. Of this total over 280 are foreign subscribers. We haven't checked but there must be over 50 countries represented. It is interesting that for several years we had no subscriptions from Japan. Now we have 20. Must be some printers available in that country. The same thing for Australia with 19 subscribers. England, Italy and Germany lead the list.

From listening on the bands we might think RTTY was in the doldrums but there must be plenty of interest from our experience. Along with mailing Beginners Handbooks and UART reprints, new subscribers and renewals we find it hard to keep up with our TV football watching.

As we write this the word is that the Canadian Postal Strike has been settled. (I can't imagine being without mail for over a month.) As soon as we get an OK we will mail the past two issues and also see that any renewals that have been held up are kept current. I would assume that CARTG Contest logs will be accepted until at least the end of January 1976.

For those who feel lucky, or want a good time and attend a Hamvention at the same time, Saroc is Jan 8 to 11. See ad in classified for full details.

Not too early to start making plans for Dayton, April 23-24-25. Our hospitality room will be at the same place - Kings Room (formerly the South room) at the Imperial North Motel, Needmore Rd. and I-75, Dayton, Ohio. An early room reservation is suggested.

FIFO's for the UT-4 -- Pete W6KS advises us that he will not be able to furnish the Fairchild 33512 FIFO again until late January when the new plastic version should be available.

BACK ISSUES -

New subscriptions and classified ads are cash in advance as we have no method for billing. New subscriptions will be started with the current issue and one back issue, if requested. Please do not ask us to start any further back than this. Back issues - if available - may be ordered at 30¢ each at time of subscription. The JOURNAL is mailed about the 20th of the month preceding the dated month. May and June are a combined issue and July-August is a combined issue.

The ONLY back issues available are listed below. 30¢ each.

1972-SEPT.-OCT.-NOV.-DEC.-[4]
1973-ALL ISSUES- [10]
1974-FEB.-NOV.- [2]
1975-OCT.-DEC.- [2]

RTTY BINDERS---\$4.00

BEGINNERS HANDBOOK- \$2.50
UART REPRINTS- 50¢

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Box 837

Royal Oak, MI. 48068

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I got on RTTY

Dear Ed.,

Being a very new newcomer to Amateur RTTY, perhaps my experiences in getting started will prove to be of interest to others who are subscribers but not yet active.

I'll try to be brief.

My interest in RTTY goes back to the early 1950's, when my good friend George Lupey, W8VMP, put his first Mod. 12 (?) on the air. He had it haywired all over his shack, had no cover on the machine, and the appearance - and the noise - was awesome. George used the "hunt-and-peck" method of typing, and so did most of the gang with whom he used to QSO. It often took hours for each of the six or seven in the roundtable to make one transmission each.

Naturally, things have improved since then - both for my friend, George, and for amateur RTTY.

My first machine was a discarded Western Union machine. My first T.U. was the W2JAP model which remained in the ARRL Handbook for so many years. I used torroids instead of the TV coils listed. It was a fair T.U. for "reading the mail" on the 850 shift stations. However, when I finally got up enough nerve to build an AFSK unit and put the TR-4 on the air, many stations had converted to 170 shift. (It turned out that my shift was closer to 450 Hz.)

My only contact with this set-up was with XE1WU. He gave me a good report with exception that shift was 450. His ST-6 received it ok.

I junked the W.U. machine and cast about for something better. . . and, of course, I got rid of the AFSK unit also. I purchased a Kleinschmidt TT-100. (That is, I bought parts of about three of these and assembled one.) It worked real well, especially after I built my ST-5. The ST-5 was built up almost entirely of junkbox parts, resistors and capacitors were seriesed and/or paralleled to get close to the correct values. It worked. By this time, late 1972, almost everyone was on 170 shift.

I built a 2-transistor oscillator for AFSK, after failing to get the AK-1 to work, and adjusted my Mark and Space tones to look just like the received patterns from Irv Hoff (whom I greatly admire, but have never had the nerve to work), and went on the air. Signal reports have been good, and the pleasure has been great.

At present, all of this equipment is at the club station where I work. We have no tape equipment at the club, but we are contemplating ordering some real soon. Call is WA5VEI.

At my home QTH (call W5HBL) I now have a model 19 which is going to require a lot of work, a Swan 500-C, and almost no antenna - yet.

Am building a "fancy" version of ST-5 circuit with components for 170 shift only. In addition, it will contain autostart and antispace circuits. In addition, the front panel will contain pilot lights to tell positions of each switch, etc. Am looking forward to its completion so I can start overhaul of the Mod. 19.

Also have the TT-100 in home station. Plan to set it up for 100 wpm work.

And, of course, like most who print RTTY, I'm hoping for the ST-6 (or the not-yet-released ST-6A) . . . learned about this one from reading the mail on Irv.

Sincerely and 73,
Paul Smallwood, W5HBL

What Are They ? -

E.H. "8111" CONKLIN, K6KA

The April issue on page 8 says that W5SHC has asked questions about unprintable RTTY on the HF bands.

Of course, there are several types which, even if there are start and stop pulses, will not print. These include those with more than 5 intelligence bits, or are time-division duplexed or multiplexed. However, the early Teletype duplex unit, a mechanical device, will print the A channel if the range selector is at one end, and the B channel is at the other end.

Probably most of W5SHC's problems are intruders with some form of encryption. When these signals are 5-unit start/stop, stay in sync and have regular spacing, they are cryptographic groups. The second kind is the character-scrambled ones which also hold sync but the CR LF FIG and other such characters come anywhere, with a bit of mess on the printed page; this will be seen in texts of messages from YTLO (was XYZZ for a while) in Taiwan on 14012 kHz evenings.

Then there are the baud-scrambled devices, particularly the synchronous systems. This will be found on the USSR

CONTINUED ON PAGE 4

CLASSIFIED ADS-- 30 words \$2. Additional words 4¢ ea.

Cash with copy, Deadline 1st of Month.

MORE RTTY! ONLY HAM RADIO MAGAZINE consistently brings you more RTTY articles and better RTTY articles than any other general amateur magazine. You need RTTY Journal, but you need HAM RADIO also. \$10.00 per year, \$20.00 for 3 years. Ham Radio, Greenville, NH 03048.

ST-5 DEMODULATOR, NEW switchable 170/850, meter, loop supply, all usual features plus autostart, vinyl woodgrain finish case. \$125 UPS prepaid 48. Fred Firestone, WB9JEE, 806 N. School St., Normal, IL 61761 309/452-4032.

HAL COMMUNICATIONS CORP. is closing out the RKB-1 RTTY Keyboard. A limited number of un-assembled units are available. Write for details of this offer. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, Illinois 61801. Phone 217-367-7373.

DOVERTON MPC-1000 MULTIPATH-DIVERSITY RTTY Terminal Unit with automatic Multipath Corrector, Full In-Band Diversity, 2 inch CRT cross display, continuously variable mark and space channels (1500 to 3200 Hz), active integrated circuit filters (no toroids), noise correlator, dual autostart (Marking or FSK RTTY), phase continuous-sine wave AFSK tone generator, EIA and MIL FSK voltage level outputs, CW ID provisions for AFSK and FSK, internal RY generator, automatic mark-hold, anti-speech, anti-CW, anti-fade, adjustable internal 180 volt loop supply, signal loss indicator (LED) loop keyer monitor (LED), provisions for Uart/FIFO interface. 17" x 3.5" x 9", 10 lbs., 110/220 vac, 50-400 Hz \$495.00 FOB stock to 30 days ARO. Your QSL will bring complete specifications. DOVERTON, P.O. Box 267, 627 Fremont Avenue, South Pasadena, Ca. 91030, (213-682-3705).

ANY ISSUE OF RTTY JOURNAL reproduced \$1.00 PP. I have a complete file of all issues. R. Wilson, WB9JEF, 4011 Clearview Dr. Cedar Falls, IA. 50613

HAL COMMUNICATIONS CORP. Headquarters for electronic RTTY equipment. In demodulators, choose from the incomparable ST-6 or, for a low cost beginning in RTTY, the ST-5. Tailor either to your requirements by selecting the 425 Hz press discriminator, the XTK-100 or AK-1 AFSK oscillators and the ST-5AS autostart for the ST-5. Full details available in our current catalog. Compare before you buy. BankAmericard and Master Charge plans available. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, Illinois 61801. Phone 217-367-7373

WANTED: 32 and 33 ASR's. Also perfs, readers, UCC's, etc. Highest cash prices. PO Box 1219, South Station, Newark, N.J. 07114 (201) 824-1300

FOR SALE: 28 ASR's. Good working condition, 40 units available at \$999 each. Call Henry Holder, (817) 429-3021.

RTTY VIDEO DISPLAY UNIT -- 1000 characters, plugs into loop or logic circuits, ASCII or BAUDOT available. Kit \$395, assembled \$495. Leland Associates, 18704 Glastonbury Rd., Detroit, Michigan, 48219

CLOSEOUT! PETIT LOGIC MT-5 Morse to RTTY (either Baudot or ASCII) converters. Fantastic price reductions. Semi-kit now just \$95, complete parts kit (no power supply or cabinet) \$255 and 2 units available assembled and tested for \$380. ALSO, Baudot to ASCII converter kit for \$59 - perfect for the new low cost SWTP video display unit! LIMITED SUPPLY AVAILABLE ON ALL ITEMS. Walters Ind. Box 583, Oak Harbor, WA 98277.

HAL COMMUNICATIONS CORP. thinks you'll need the ST-6 to win those Dovers. If you aren't already using the ST-6, write for details. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, IL 61801. Phone 217-367-7373.

NEWS-NEWS-NEWS - Amateur Radio's News-paper, "Worldradio", Trial subscription - Two issues for one dollar. "Worldradio" 2509-F Donner Way, Sacramento, Calif. 95818.

PART TIME TELETYPE REPAIR. For expert repair of model 32 & 33 teletype call Harvey (201-773-5450) in New Jersey after 6 p.m. You will never find a better repairman. He also does detail refurbishing.

SAROC ELEVENTH LAS VEGAS NATIONAL CONVENTION, January 8 - 11, 1976, Hotel Sahara Space Convention Center. Advance Registration \$12.00 per person; with midnight show \$22.00; with dinner show \$29.00; Special Hotel Sahara Safari airfare packages from selected cities with scheduled airlines serving Las Vegas. SAROC special rate extended only to those who advance register or register at the door. Send for details, SAROC, POB 945, Boulder City, Nevada 89005.

SALE: FEMALE JACK Panels containing 144 jacks to a 19 inch panel. \$14.00; Female jack panel containing 24 Jacks, Fahnestock type 218A. \$5.00; Rack cabinets 24 inches wide 82 inches high 26 inches deep, open front and rear door, Blue with Aluminum trim \$50.00; Tuning forks 96.19 vps or 120 vps unused \$2.00 each; Mite motor, type PB/82U 115 VAC 60 Cy Unused \$28.00; TT socket wrench 7/16 inch on 12 inch handle 1.00; Kleinschmidt allen wrench on 12 inch handle 1.00; Gears for model 14 T.D. with 1800 rpm syn motors 60 wpm unused \$8.50 Set; Model 14 Typing Reperf. 60 wpm gears \$7.75; Perforator tape 11/16 inch, Box of 10 rolls 4.90 or case of 40 rolls \$14.90; Red and Black ribbons nylon, 6 for \$6.00 or dozen for \$9.00; Roll paper \$2.00 per roll; Copyholder for model 28 printer unused \$3.95; Distortion test set, type TDA-2 containing scope \$39.00; Model 15 platen unused \$5.50. Also available model 14, 15, 19, 32, 33 machines. Send us a list of your Teletype requirements. Atlantic Surplus Sales Co. 3730 Nautilus Ave., Brooklyn N.Y. 11224 Tel. (212) 372-0349

PC BOARDS FOR THE UT-4, double sided, thru-hole plated, plug-in edge connectors. Write for details. AK-2 kit for \$19.95, XK-2 STAL AFSK kit \$34.95. ELECTRONIC DEVELOPMENT, INC., P.O. Box 951, SALEM, OREGON 97308 (503) 399-8660

HAL COMMUNICATION CORP. Replace those machines with the HAL electronic RTTY RVD-1005 Visual Display Unit and DKB-2010 Dual Mode Keyboard. You'll have a quiet, reliable system allowing you to transmit and display Baudot code at all four standards speeds. Full details available in our data sheets. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, Illinois 61801. Phone 217-367-7373.

NEW TTY ROLL PAPER; 4 1/2 inches diameter, 12 roll case - \$16.00, 5 inch diameter - 12 roll case - \$19.00. Assemblies wanted: LMU 3 & 12 motors, LESI 13s, LXD TDs; typeboxes; gears, pageprinter, reperfr, TD, 50-75-100 speed; model 29 page printers, friction feed mod. kits, parts or LP's for friction feed parts. Misc. 28 parts and assemblies. Model 28 parallel data perfs, readers, mod. kits for use with speed converters. Write for information. K8JOF, 2448 N. Wilson, Royal Oak, MI. 48073 (313) 398-5922.

RTTY PICTURE PERF TAPES. Over 400 to choose from. Chad (fully punched, no lids) 11/16 inch standard Amateur 5-level tape. Guaranteed COMPLETELY error-free. Run times from 2 minutes to 10 hours. Wide range of subjects including works of art, landscapes, pinups, animals, cartoons, as well as all of the 1974 RTTY Art Contest entries. Send 16¢ in STAMPS for listing. Joe Dickens, WA9UGE, 601 S. Dodson St., Urbana, IL. 61801.

CLASSIFIED ADS-

Give your ASCII-Baudot keyboards, Morse Code keyboard generators, or keyswitch oriented master control stations a distinct professional appearance with the Univue keyboard and control center enclosure. The 24 x 12 1/2 x 3" Univue enclosure gives you dimensional flexibility with a modern low profile appearance. The blank 23 x 8" removable aluminum front panel is easily cut to accommodate virtually any keyboard or control arrangement. Over 200 cubic inches of space in the rear is available for housing additional circuitry, allowing a complete and handsome desk top unit. The Univue enclosure body is precision machined welded steel, and is primed and surfaced light gray, ready for the color coordinated finish of your choice. Shipped complete with panel, heavy duty non-skid rubber feet, plated mounting hardware, and Money-Back Guarantee. \$29.95 plus \$4.50 shipping/handling. Send stamp for complete information and pictures to: Advanced Data Sciences, P.O. Drawer 1147A, Marion, Ohio 43302.

MAGNETIC MEMORY DRUM manufactured by Magne-Head, division of General Instruments, Hawthorne, Calif. Model 8C-161. Size 17 inches x 14 inches x 12 inches, weight about 40 pounds. Drums appear to be in excellent condition complete with connectors. Price \$275.00 each. Magnetic memory drum cabinets 24 inches x 82 inches x 26 inches complete with Drum Model 8C-161, 4 power supplies providing plus and minus 12 volts, printed circuit cards, and blower unit. Cabinets appear to be complete and in very good condition. Magnetic Memory Drum with cabinet. \$390. Photo available for \$1.00. Atlantic Surplus Sales Co., 3730 Nautilus Ave., Brooklyn, N.Y. 11224 Tel: (212) 372-0349

WANTED: Model 32 or 33 TTY. Any quantity, any condition for cash or will trade. Call: Ken Payne, (214) 252-7502.

SELL: TT/L-2 PC BOARD BY K5BQA wired with Newark parts package - never used - cost \$39, in 1967. Postpaid for \$30.00. Also have TT/L deomod, 15KSR, 19ASR, TDs, good condition. Dave Kennedy, W9DL, RR-1 Far View Rd., Elburn, IL 60119.

FOR SALE - 32ASR - MINT CONDITION. \$350.00 HAL ST-6 one year old \$245.00 R4A-T4X with MS4, excellent \$575.00. W3EK, 15 91 Meadow Glen Dr. Lansdale, PA 19448, Phone after 6 p.m. (215) 368-3392.

HAL COMMUNICATIONS CORP. announces the DS-3000 and DS-4000 series of KSR Video Display Terminals for Baudot and/or ASCII code. Offering error correction capability, multi-speed operation, and 16 lines of 72 characters per line, these terminals employ the 8080 microprocessor in what we believe is the first microprocessor based product offered to the amateur radio communications market. Request data sheet for full information. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, IL 61801. Phone 217-367-7373.

QSL CARDS PRINTED 100/\$3.95 - Send Printing & Remittance to DT, Dept. RJ, 390 Lincoln Ave., Newark, NJ 07104.

WANTED: MITE CORP. MODEL TT-299B/UG in MINT condition; Model 28KSR Mark III in MINT Condition. SELL: Henry 2K amplifier, late series, mint condition. \$425. Ronald Ott, 528 Bonita Avenue, Pleasanton, California 94566 (415-846-1459).

EXPERT REPAIR WORK. Any Teletype Corp. model. Repair work \$15.00 plus parts no matter how long it takes. Rebuilding by estimate. Write K9WRL or phone (312) 392-2358, ask for Neil. Chicago Area.

HAL COMMUNICATIONS CORP. announces the XTK-100 AFSK oscillator for those applications requiring the extra stability of crystal controlled tones. Tone pairs may be anywhere in the range from 1000 Hz to 3300 Hz with high or low tone pairs standard and others optional at extra cost. Constructed on a 3" x 6" PC board with pin-out identical to the AK-1 so that the XTK-100 is a direct plug-in replacement for the AK-1. Request data sheets for full details. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, Illinois 61801. Phone 217-367-7373.

MODEL 15KSR's \$35.00, 19KSR's with perforators, character counter, TD, Power supply, table with connectors, \$75.00. Patch panels with 80 jacks \$25.00. Milliampere meter units \$10.00. Panel rack cabinets \$25.00 and \$50.00. Xeroxed copies of 15, 19, and 28 manuals \$5.00. Kleinschmidt TPR-311 manual \$25.00. NO list so send SASE for reply. Assorted tables and much miscellaneous teletype equipment (cheap). (312) 752-1000 anytime. Goodman, 5454 South-Shore Drive, Chicago, IL. 60615.

TELETYPE MODEL 28 KSR's: Good working condition, over 200 available at \$350 each. Call: Henry Holder, (817) 420-3021.

RTTY CLOSEOUT - NS-1 BOARDS (Journal Oct. 1974) \$2.75 ppd. A few wired/tested units, still available \$29.95 ppd. Nat Stinnette Electronics, Box 1043, Tavares, FL. 32778.

HAL COMMUNICATIONS CORP. announces the availability of the RVD-1005A ASCII Video Display Unit. Serial or parallel data input, 110 or 300 baud, loop or RS 232 C levels. Request data sheet for full information. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, Illinois 61801. Phone 217-367-7373

DRILLS - DRILLS - DRILLS Carbide and high speed steel for PC board work. Send SASE for Information. Bob's Electronics Box 393 Bay City, MI 48706.

TECH MANUALS -- \$6.50 each: TT63A/FGC, CV-591A/URR following manuals \$8.50 each: TT-47/48, R-388/URR, USM-50, 51J4, FR14/U; following manuals \$10.00 each: R390A/URR, SRR-11, 12, 13, USM-32, URR-35C. Special manuals (limited quantity): TM-03315-15 TGC-14/14A \$10, Navships 95989 TT-298A/B, TT-299A/B \$12.50, Navships 0967-170-8010 UGC-38, 40, 41 \$12.50. Model 14 TD manuals \$2.50 each. Thousands more in stock. Send 50¢ (coin) for large list. W31HD, 7218 Roanne Drive, Washington, DC 20021.

THE JUNK BOX looking for parts, surplus info, selling, buying or trading gear? Use the junk box. Send S.A.S.E. for info or 50 cents for sample copy to THE JUNK BOX MAG, P.O. BOX 872 PEABODY, MASS. 01960

HAL COMMUNICATIONS CORP. will display THE line of RTTY equipment at SAROC and Miami. See you at the show!

UT-4 COMPONENTS. Reducing inventory but availability remains as heretofore except FIFO's. Regret none can be furnished until Fairchild shipments of new plastic version scheduled for late January. Computer builders: MC1408L-6 D/A converter (\$6.50) and small quantity 3341PC FIFO's (\$8.50) in stock. See prior ads for other items and prices. Peter Bertelli, W6KS, 5262 Yost Place, San Diego, CA 92109, 714-274-7061.

COUNTER BOARDS: FOR MHZ COUNTER in April 1974 Journal. Excellent performer. Numitron or LED readout. Includes eight schematics, parts list, seven large pictures, two counter boards, front end board, scaler, eight digit LED mounting board, and Universal Frequency Standard. All epoxy, plated, undrilled. \$18 postpaid US only. Bert Kelley, 2307 S. Clark Ave., Tampa, Fla. 33609.

Additional Classified
See Next Page -